REMARKS

Entry of the Amendment prior to examination, is respectfully requested.

By the present amendment, the title, specification, and abstract have all been amended to respond to the points raised in the October 15, 2002 Office Action in the parent case. It is noted that the drawings filed in the present case contain the changes made in the parent case. Also, new claim 12 has been added for consideration.

Attached hereto is a marked-up version of the changes made to the title, specification, claims and abstract by the current amendment. The attached page is captioned "**Version with Markings to Show Changes Made.**"

If the Examiner believes that there are any other points which may be clarified or otherwise disposed of, either by telephone discussion or by personal interview, the Examiner is invited to contact applicants' undersigned attorney at the number indicated below.

To the extent necessary, the applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, Deposit Account No. 01-2135 (500.39912CX1).

Respectfully submitted,
ANTONELLI, TERRY, STOUT & KRAUS, LLP

By _____

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Title:

THE TITLE HAS BEEN AMENDED AS FOLLOWS:

-- SEMICONDUCTOR DEVICE WITH MULTILAYER CONDUCTIVE STRUCTURE FORMED ON A SEMICONDUCTOR SUBSTRATE --

IN THE SPECIFICATION:

On Page 14, paragraph beginning at line 5 and continuing through page 15, has been amended as indicated below:

Plugs, which are each formed of a main conductive film 15 coated with adjacent conductive films (first conductive films) 14a and 14b for preventing diffusion, are respectively formed in contact holes formed in the insulating film 13, and are connected to the diffusion layers 2, 3, 4, and 5. A multilayer interconnection, which is formed of a main conductive film 17 coated with adjacent conductive films 16a and 16b for preventing diffusion, is connected through these plugs. This multilayer interconnection can be obtained by a process in which, for instance, grooves for interconnection are formed in an insulating film 18, and after the adjacent conductive film 16a is formed thereon by such as chemical vapor deposition, the main conductive film 17 is formed by such as plating, followed by the formation of the adjacent conductive film 16b thereon by such as chemical vapor deposition. On top of this multilayer interconnection, a plug, which is formed of a main conductive film 20 coated with an adjacent conductive film 19, is formed in a contact hole formed in an insulating film 21, and is connected to the aforementioned multilayer interconnection. A second multilayer interconnection, which is formed of a main conductive film 23 coated with adjacent conductive films 22a and 22b, is connected through this plug. This second multilayer interconnection can be obtained by a process in which, for instance, grooves for interconnection are formed in an

insulating film 24, and after the adjacent conductive film 22a is formed thereon by such as chemical vapor deposition, the main conductive film 23 is formed by such as plating, followed by the formation of the adjacent conductive film 22b thereon by such as chemical vapor deposition. An insulating film 25 is then formed over the conductive film 22b and the insulating film 24.

On Page 36, paragraph beginning at line 27 and continuing through pages 37 and 38, has been amended as indicated below:

Further, Fig. 15 shows a cross-sectional structure of principal portions of a semiconductor device in accordance with a fourth embodiment of the invention. The difference of the fourth embodiment from the first embodiment lies in that the interconnection layer formed by the main conductive film 17 is connected via a conductive plug 32 to a gate electrode 29 formed on a gate insulating film 28. In this case, since the gate electrode 29 is in contact with the [conductor] conductive plug [29] 32 and an insulating film 30, to improve the reliability it suffices if the constituent elements of the gate electrode 29 are selected such that all of the following requirements are met: that the difference $\{|ap - an|/ap\} \times 100 = A(\%)$ between the short side an in the unit rectangular cell of the closest packed crystal plane formed by the main constituent element of the gate electrode 29 and the short side ap in the unit rectangular cell of the closest packed crystal plane formed by the main constituent element of the conductive plug 32 and the difference $\{|bp - bn|/bp\} \times 100 = B(\%)$ between the long side bn in the unit rectangular cell of the closest packed crystal plane formed by the main constituent element of the gate electrode 29 and the long side bp in the unit rectangular cell of the closest packed crystal plane formed by the main constituent element of the conductive plug 32 satisfy the inequality $\{A + B \times (ap/bp)\} < 13\%$, that the melting point of the main constituent element of the gate electrode 29 is not less than 1.4 times that of the main constituent element of the conductive plug 32, that the gate electrode 29 contains at least one different kind of element in addition to the main constituent element, that the difference between the atomic radius of at least one kind of added element among the different kinds of elements and the atomic radius of the main constituent

element of the gate electrode 29 is not more than 10%, and that the bond energy between the added element and silicon (Si) is not less than 1.9 times that of the main constituent element of the gate electrode 29 and silicon (Si). Specifically, in a case where the conductive plug 32 has the copper (Cu) film as its main constituent element, it suffices if the gate electrode 29 has as its main constituent element at least one kind of element selected from rhodium (Rh), ruthenium (Ru), iridium (Ir), osmium (Os), and platinum (Pt), and contains as an added element at least one kind of element selected from palladium (Pd), cobalt (Co), nickel (Ni), and titanium (Ti).

IN THE CLAIMS:

New Claim 12 has been added.

IN THE ABSTRACT:

The abstract has been amended as follows:

[Problem: In] A highly reliable [a] semiconductor device having a multilayer structure [comprising] including an insulating film, an adjacent conductive film, and a main conductive film[, to provide a highly reliable semiconductor device] in which [defects in the multilayer structure such as] adhesive [fracture] fractures, voids and disconnections [and cracks] are unlikely [difficult] to occur. [Further, to provide a highly reliable semiconductor device in which voids and disconnections due to migration are difficult to occur.] [Solving Means: The] Regarding main constituent elements of the adjacent conductive film and the main conductive film, lattice mismatching [between a main constituent element of an adjacent conductive film and a main constituent element of a main conductive film] is made small, the melting point [of the main constituent element of] the adjacent conductive film is set to be not less than 1.4 times that of the main constituent element of the main conductive film, the adjacent conductive film contains at least one different kind of element [in addition to the main constituent element], the difference between the atomic radius of [at least one kind of] an added element [among the different kinds of elements]

and that the atomic radius [of the main constituent element of] the adjacent conductive film is set to be not more than 10%, [and the] and/or bond energy between the added element and silicon (Si) is [set to be] not less than 1.9 times that of the main constituent element of the adjacent conductive film and silicon (Si).